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Communicable Disease Report

Hawai'i Department of Health
Communicable Disease Division

http://www.state.hi.us/doh/resource/comm_dis/cdr.html May/June 2004

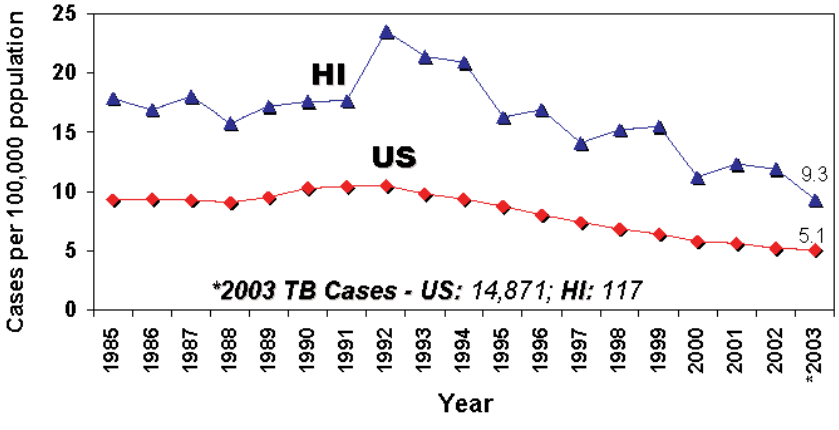
Epidemiology of Tuberculosis in Hawai`i, 2003

The State of Hawai`i consistently reports one of the highest annual tuberculosis (TB) case rates in the country. In 2003, Hawai`i again led the nation in state TB case rates, with 9.3 new cases per 100,000 population and 117 total cases. TB case counts decreased 20.9% from 2002, when there were 148 new cases of TB in Hawai`i. Although rates have declined steadily over the past decade, Hawai`i's TB case rate in 2003 was still almost double the national case rate (see Figure 1). Nationally, there were 14,871 TB cases in 2003, yielding a TB case rate of 5.1 cases per 100,000 (CDC, provisional 2003 data). In 2003 there was also a significant increase in multi-drug resistant TB (MDR-TB) cases in Hawai`i, although the overall percentage of cases with any TB drug resistance decreased.

Cases by County

The City and County of Honolulu continues to report the highest number of TB cases in the state, with 96 cases of TB and an incidence rate of 10.7 cases per 100,000 population, accounting for 82.1% of the state's TB morbidity in 2003. Hawai`i County reported 10 new cases of TB (incidence rate: 6.5 cases per 100,000 population), Maui County reported eight new cases of TB (incidence rate: 6.0 cases per 100,000 population), and Kaua`i County reported three new cases of TB (incidence rate: 5.0 cases per 100,000 population).

Figure 1: TB Case Rates Hawai`i vs. US, 1985 – 2003*



As of April 16, 2004 *Provisional 2003 US data, CDC

TB Fatalities

Since the development of antibiotics to treat active TB disease in the 1940s, death rates from TB have fallen in Hawai`i as well as nationally. There was one reported death from TB last year in Hawai`i, giving a TB mortality rate of 0.1 deaths per 100,000 population. In comparison, the latest published national TB mortality rate was 0.3 deaths per 100,000 population, or 749 TB deaths in the US in 2001 (CDC, 2003).

Age of Cases

The largest group of new TB cases reported in 2003 were 65 years and older; 37.6% (n=44) were in this age group. Many of these cases acquired latent TB infection (LTBI: see "Definitions" box) in their country of origin and are now developing active TB disease due to waning immunity. There were three new cases of TB under 18 years of age at diagnosis: two under five years of age, and one from five to 14 years. The

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majority of TB cases reported nationally in 2002 were younger: 35% were from 25 to 44 years of age (CDC, 2003).

Disease Sites

Ninety-one percent (n=107) of cases reported in Hawai`i in 2003 were pulmonary TB, i.e. TB affecting lung tissue. Tuberculosis, however, is a systemic disease and can affect any area of the body. Nine percent (n=10) of cases had extrapulmonary TB, exclusively outside the lungs. National TB data show that a lower proportion (81%) of all cases reported in the US in 2002 were pulmonary (CDC, 2003).

Drug Resistance

The percentage of TB cases in Hawai`i with any drug resistance decreased from 14.9% in 2002 to 9.4% in 2003. However, the proportion of MDR-TB increased from 0.7% (n=1) of all cases in 2002 to 3.4% (n=4) in 2003. [CDC defines MDR-TB as resistance to at least two first-line TB drugs isoniazid (INH) and rifampin (RIF)]. All four MDR-TB cases in Hawai`i in 2003 were foreign-born; two were born in Korea, one in the Philippines, and one in Palau. Two of the MDR-TB cases were found through immigrant screening by the CDC Quarantine Station at the Honolulu airport. Nationally, 1.2% of all cases reported in the US in 2002 had primary MDR-TB (with no previous diagnosis of TB) (CDC, 2003). To prevent development of drug resistant TB, an initial four-drug regimen is usually recommended for newly diagnosed cases with directly observed therapy (DOT) (CDC, 2000).

TB and HIV/AIDS

TB-HIV co-infection remains less common in Hawai`i than on the US mainland. In 2003, only one TB case in Hawai`i was co-infected with HIV, accounting for less than 1% of the total cases. In comparison, an estimated eight percent of all TB cases diagnosed in the US in 2001 were co-infected with HIV (CDC, 2003). These cases are generally concentrated in large urban centers on the mainland.

Effects of Immigration

Immigration, primarily from Asia and the neighboring Pacific Islands, continues to have a major impact on Hawai`i's TB morbidity. In 2003, the US Customs and Border Protection officially admitted over 3,100 new immigrants to Hawai`i, 69.0% of whom were from the Philippines (US Customs and Border Protection, 2003). In the same year, 98 new cases, representing 83.8% of the state's TB morbidity, were in foreign-born individuals.

In comparison, only 53.3% of all the active TB cases reported in the US in 2003 were foreign-born, although this percentage has increased steadily from 29% in 1993 (CDC, provisional 2003 data). Please note, however, that CDC counts persons born in the US territories (such as Puerto Rico) and the Compact of Free Association (COFA) nations – Republic of Marshall Islands, Federated States of Micronesia, and Palau – as US-born.

Persons born in the Philippines accounted for the majority of Hawai`i's foreign-born cases in 2003, making up 60.2% of this group, followed by persons born in Korea (7.1%) and Viet Nam (5.1%). Individuals arriving from the COFA nations, which made up 9.2% of the foreign-born TB cases, are exempt from the overseas health examination usually required of immigrants to the US, and thus are not actively screened for TB before arrival into Hawai`i. These areas with a high TB incidence are contributing to an average of 5-10% of Hawai`i's TB cases every year. Hawai`i's Targeted Testing program performed screening in this group, as well as developed some health education materials for this at-risk population. Among all the TB cases reported in the US in 2002, the three largest foreign-born groups included those from

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About Hawai`i's TB Control Program:

The Hawai`i State TB Control Program provides administrative TB screening, chest x-rays and all TB medications free of charge to patients with LTBI, suspect or active TB. In addition, clinical services (nurse and physician visits) including DOT and bilingual outreach in 11 different dialects are available. Programmatic activities include the TB registry, surveillance/epidemiology, contact investigations, and health education. Several new research projects with the CDC have also been initiated in the last few years. The TB Program underwent a complete renovation last year, and now has a new state-of-the-art digital x-ray imaging system as well as a clinic with negative air pressure to decrease the risk of disease transmission.

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Mexico (25%), the Philippines (11%), and Viet Nam (9%) (CDC, 2003).

Role of Immigrant Screening

Hawai`i's TB Control Program has a good working relationship with the Centers for Disease Control and Prevention's (CDC) Division of Global Migration and Quarantine office in Hawai`i. Honolulu is one of eight US cities with a CDC Quarantine Station located at its airport. The CDC Quarantine Station plays a key role in controlling the entry of communicable diseases into the US, including infectious TB. The Quarantine Station passes along important documentation to the TB Control Program in Hawai`i:

1) Documentation from immigrants arriving in Hawai`i who have been designated as TB Class A (active, infectious TB), Class B1 (active, non-infectious TB), and Class B2 (inactive TB) at the time of medical evaluation in their country of origin. This process facilitates follow-up of these cases by Hawai`i's TB Control Program.

2) Chest x-rays from overseas medical examinations of most immigrants who enter Hawai`i, regardless of their TB Class. The TB Program then reviews the x-rays for abnormalities that may be indicative of active TB, and may recommend further screening.

Many of Hawai`i's cases are diagnosed soon after arrival in the US: 36% of all foreign-born cases diagnosed from 1999 to 2003 in Hawai`i were diagnosed within the first year after arrival. In comparison, only 19% of all foreign-born cases reported in the US in 2002 were diagnosed within a year after arrival in the US.

The Fight Continues…

Although TB morbidity has decreased, the State of Hawai`i still leads the nation in TB incidence. Since most of our cases are imported from other countries, the close relationship between Hawai`i's TB Control Program and the CDC Quarantine Station at the Honolulu airport is key in controlling the spread of TB in the state. This partnership is especially important as TB drug resistance increases globally.

For further information, please call 808-832-5731 in Honolulu, or visit our web site at: *http://www.hawaii.gov/health/family-child-health/contagious-disease/tb/index.html*

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Prevention and Control of Meningococcal Disease

Editor's Note. On Wednesday, March 24, 2004, some college and high school classmates played a game of pick-up basketball in Honolulu. On March 25, one of the boys was found dead in the home he and others were renting. He had no previous history of illness, although a rash was noted on his body. One of the boys who played basketball with the deceased was the son of Kaiser Permanente infectious disease physician Dr. Francis Liu. On March 28, a parent of one of the other boys called Dr. Liu to express their concern regarding the man who had expired.

On the same day, Dr. Liu's son developed a febrile illness, and was taken to the emergency room. On March 29, Dr. Liu called the Department of Health (DOH) to express his concern of possible meningococcal meningitis and to ask for assistance in confirming the diagnosis of the cause of death of the deceased man and locating his contacts for antibiotic prophylaxis. The DOH contacted the coroner's office that day. An autopsy had not been conducted, as the day after the body was delivered (March 26) was the Kuhio day holiday. No rash was visible. Appropriate tissues were collected and submitted for diagnostic testing. Meningococcal meningitis was subsequently identified as the cause of death.

On March 30, through word of mouth the DOH conducted a clinic to give prophylaxis to contacts of the deceased. Over 90 people were given prophylactic antibiotics. Thanks again to the efforts of Dr. Liu, a contact in London was traced, and also received antibiotic prophylaxis.

Were it not for his astute suspicion of the possibility of an unattended death due to

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Neisseria meningitidis and rapid notification of the DOH, the diagnosis would have not been made, and contacts of the case may have subsequently developed the disease.

Meningococcal Vaccine ACIP

The following is a synopsis of the Recommendations of the Advisory Committee on Immunization Practices (ACIP) on the Prevention and Control of Meningococcal Disease and Meningococcal Disease and College Students, published in the Morbidity and Mortality Weekly Recommendations and Reports on June 30, 2000.

Introduction

Each year, 2,400 to 3,000 cases of meningococcal disease occur in the United States, resulting in a rate of 0.8 to 1.3 per 100,000 population. *Neisseria meningitidis* causes both sporadic disease and outbreaks; however, outbreaks represent <3% of total U.S. cases.

Rates of meningococcal disease remain highest for infants, but in the past decade, rates have increased among adolescents and young adults. The case fatality rate for meningococcal disease is 10%, despite the continued sensitivity of meningococcus to many antibiotics, including penicillin. Meningococcal disease also causes substantial morbidity, 11% to19% of survivors have sequelae e.g. neurologic disability, limb loss, and hearing loss.

Background

In the United States (U.S.), approximately 95% of cases of meningococcal disease are sporadic. However since 1991, the frequency of localized outbreaks has increased. Most of these outbreaks have been caused by serogroup C. In addition, localized outbreaks caused by serogroups Y and B organisms have also been reported. The proportion of sporadic meningococcal cases caused by serogroup Y also increased from two percent between 1989 to 1991 to 30% between 1992 and 1996. The proportion of cases caused by each serogroup varies by age group; more than half of the cases among infants less than one year of age are caused by serogroup B, for which no vaccine is licensed or available in the U.S.

Persons who have certain medical conditions are at increased risk for developing meningococcal disease, particularly persons who have deficiencies in the terminal common complement pathway (C3, C5-9). Antecedent viral infection, household crowding, chronic underlying illness, and both active and passive smoking also are associated with increased risk for meningococcal disease.

Meningococcal Polysaccharide Vaccines

The quadrivalent A,C, Y, W-135 vaccine (Menomune®-A,C,Y,W-135, manufactured by Aventis Pasteur) is the formulation currently available in the United States. Each dose consists of 50 micrograms of the four purified bacterial capsular polysaccharides.

Primary Vaccination

For both adults and children, vaccine is administered subcutaneously as a single, 0.5 ml dose. The vaccine can be administered at the same time as other vaccines but should be given at a different anatomic site. Protective levels of antibody are usually achieved within 7 to10 days of vaccination.

Vaccine Immunogenicity and Efficacy

The immunogenicity and clinical efficacy of the serogroups A and C meningococcal vaccines have been well established. The serogroups A and C vaccines have demonstrated estimated clinical efficacies of ≥85% in school-aged children and adults and are useful in controlling outbreaks. Serogroups Y and W-135 polysaccharides are safe and immunogenic in adults and in children over two years of age. Although clinical protection has not been documented, vaccination with these polysaccharides induces bactericidal antibody. The antibody responses to each of the four polysaccharides in the quadrivalent vaccine are serogroup-specific and independent.

Duration of Protection

In infants and children less than five years, measurable levels of antibodies against the group A and C polysaccharides decrease substantially during the first three years following a single dose of vaccine. In healthy adults, antibody levels also decrease, but antibodies are still detectable up to 10 years after vaccine administration.

Recommendations for use of Meningococcal Vaccine

Current Advisory Committee on Immunization Practices (ACIP) guidelines suggest that routine vaccination of civilians with the quadrivalent meningococcal polysaccharide vaccine is not recommended because of its relative ineffectiveness in children less than two years of age (the age group with the highest risk for sporadic disease) and because of its relatively short duration of protection. However, the vaccine is recommended for use in control of serogroup C meningococcal outbreaks.

College freshmen, particularly those living in dormitories or residence halls, are at modestly increased risk for meningococcal disease compared with persons the same age who are not attending college. Vaccination with the currently available quadrivalent meningococcal polysaccharide vaccine will decrease the risk for meningococcal disease among such persons. Vaccination does not eliminate risk because a) the vaccine confers no protection against serogroup B disease and b) although the vaccine is highly effective against serogroups C,Y, W-135, and A, efficacy is less than 100%. ACIP has issued the following recommendations regarding the use of meningococcal polysaccharide vaccines for college students:

- Providers of medical care to incoming and current college freshmen,

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particularly those who plan to or already live in dormitories and residence halls, should, during routine medical care, inform these students and their parents about meningococcal disease and the benefits of vaccination. ACIP does not recommend that the level of increased risk among freshmen warrants any specific changes in living situations for freshmen.

- College freshmen who want to reduce their risk for meningococcal disease should either be administered vaccine or directed to a site where vaccine is available.
- The risk for meningococcal disease among non-freshmen college students is similar to that for the general population. However, the vaccine is safe and efficacious and therefore can be provided to non-freshmen undergraduates who want to reduce their risk for meningococcal disease.
- Colleges should inform incoming and/or current freshmen, particularly those who plan to live or already live in dormitories or residence halls, about meningococcal disease and the availability of a safe and effective vaccine.
- Public health agencies should provide colleges and health-care providers with information about meningococcal disease and the vaccine as well as information regarding how to obtain vaccine.

Routine vaccination with the quadrivalent vaccine is also recommended for certain high-risk groups, including persons who have terminal complement component deficiencies and those who have anatomic or functional asplenia. Research, industrial, and clinical laboratory personnel who are exposed routinely to *Neisseria meningitidis* in solutions that may be aerosolized also should be considered for vaccination.

Vaccination with the quadrivalent vaccine may benefit travelers and U.S. citizens residing in countries in which *N. meningitidis* is hyperendemic or epidemic, particularly if contact with the local population is prolonged. Epidemics of meningococcal disease are recurrent in that part of sub-Saharan Africa known as the "meningitis belt," which extends from Senegal in the West to Ethiopia in the East.

Revaccination

Revaccination may be indicated for persons at high risk for infection, e.g. persons residing in areas in which disease is epidemic, particularly for children who were first vaccinated when they were less than four years of age; such children should be considered for revaccination after two to three years if they remain at high risk. Although the need for revaccination of older children and adults has not been determined, antibody levels rapidly decline after two to three years, and if indications still exist for vaccination, revaccination may be considered three to five years after receipt of the initial dose.

Precautions and Contraindications

Adverse reactions to polysaccharide meningococcal vaccines are generally mild; the most frequent reaction is pain and redness at the injection site, lasting for one to two days. Transient fever occurred in up to 5% of vaccinees in some studies and occurs more commonly in infants.

Severe reactions to polysaccharide meningococcal vaccine are uncommon. Most studies report the rate of systemic allergic reactions (e.g. urticaria, wheezing, and rash) as 0.0-0.1 per 100,000 vaccine doses. Anaphylaxis has been documented in <0.1 per 100,000 vaccine doses. Neurological reactions (e.g. seizures, anesthesias, and paresthesias) are also infrequently observed.

For More Information

For further information, see "Prevention and Control of Meningococcal Disease and Meningococcal Disease and College Students" in MMWR 2000; 49 (No. RR-7): 1-22, visit the National Immunization Program website at http://www.cdc.gov/nip, or call the Hawai`i Immunization Program in Honolulu at (808) 586-8300.

Reference:

Centers for Disease Control and Prevention. Prevention and control of meningococcal disease and Meningococcal disease and college students: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR*, 2000; 49 (No. RR-7): 1-22.

Campylobacteriosis in Hawai`i

Background

Campylobacteriosis is a major cause of bacterial foodborne illness in the United States. Each year it is estimated that 2.4 million people or approximately 1% of the population become infected with *Campylobacter jejuni* and it is associated with an estimated 124 deaths.[1]

Approximately 76 million people contract foodborne illnesses per year. Each year, 325,000 people are hospitalized and 5,000 deaths occur.[2] The hospitalization costs as a result of foodborne illnesses are estimated at over $3 billion each year and the cost of lost productivity is estimated at between $20 billion and $40 billion each year.[3]

Campylobacter organisms are curved and spiral-shaped gram-negative rods that are primarily zoonotic. Cattle, sheep, pigs, birds, and domestic pets have been implicated as reservoirs for infection.[4] Campylobacter requires special media and atmospheric conditions to grow in

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the laboratory but have been reported to survive freezing and thawing.[5]

Campylobacteriosis became a reportable disease in Hawai`i in May 1990 (§HRS 325-2). The number of cases reported steadily increased from 202 cases in 1991 to 855 cases in 1996. From 1997-2003, case counts have plateaued. Because clinical laboratories are not required to send isolates to the Department of Health (DOH) laboratory, annual cases may be underreported.

Campylobacter enteritis is generally self-limiting. After an incubation of two to five days, symptoms of diarrhea, fever, and abdominal cramping last three to seven days. About one out of every 1,000 campylobacteriosis cases develop Guillan Barre Syndrome (GBS), a demyelinating disease causing acute neuromuscular paralysis. Approximately 40% of GBS cases are found to be preceded by a *Campylobacter* infection.[6] Reactive arthropathy (Reiter syndrome) is another autoimmune sequela of *Campylobacter* infections.[7]

Most cases of campylobacteriosis are sporadic. Consumption of raw milk has been implicated as the source of infection in 15 of the 38 outbreaks of human campylobacteriosis reported to CDC between 1990 and 2000.[8] Other studies have reported the consumption of poultry as the most commonly identified risk factor for *Campylobacter* infection.[9]

Hawai`i has the highest rate of *Campylobacter* jejuni infections in the nation, at 71.5 cases per 100,000 population. The cause of Hawai`i's high incidence rates of *Campylobacter* infection remains elusive.

1998 Case Control Study

In 1998, the DOH conducted a case control study to determine indigenous exposures that contribute to the high incidence of sporadic *C. jejuni* infection in the state.[10] A total of 211 case patients with diarrhea and confirmed *Campylobacter* infection were enrolled in the study along with a matched control subject for each case patient. This study used matched logistic regression analyses which identified two significant independent risk factors; eating chicken prepared by a commercial food establishment in the seven days before case illness onset (adjusted odds ratio [AOR], 1.9; P=.03), and consuming antibiotics during the 28 days before illness onset (AOR, 3.3; P=.03) . The FoodNet sites recently reported that the largest population attributable fraction of risk for sporadic Campylobacter infections was related to consumption of chicken prepared at a restaurant.[11] Further study of the association of *Campylobacter* illness with commercially prepared chicken and prior antibiotic use was pursued.

Chicken Studies

With the assistance of the United States Department of Agriculture and the University of Hawaii, John A. Burns School of Medicine, College of Medical Microbiology and Tropical Medicine, a case study was conducted to

1. determine the prevalence of the contamination levels of wholesale chickens with *Campylobacter*,
2. to determine the frequency of the wholesale chicken clonal DNA patterns observed in the clinical isolates.

The study design was based on the hypothesis that chicken available for consumption in commercial eating establishments is contaminated with strains of *Campylobacter* responsible for human illness. It was also hypothesized that the possible sources of contamination may be the wholesale poultry available to the establishment and that transmission involves undercooked or cross-contaminated chicken. To address these hypotheses, we pursued the following specific aims:

Specific Aim #1. To use interviews of cases to identify commercial eating establishments that may be potential sources of infection involving *Campylobacter* contamination of ready-to-eat chicken.

A case was identified through a laboratory confirmed *Campylobacter* report. A standardized questionnaire was administered to participants that collected data regarding demographics, eating outside of the home prior to their onset, cooking and eating chicken inside of the home, and prior antibiotic use before onset.

Inclusion criteria:

- Clinical isolate confirmed by the DOH as *C. jejuni*
- Case in the State of Hawai`i for seven days period prior to onset of illness.
- Onset of illness within one week of a visit to local restaurants or food establishments from which the patient procured ready-to-eat chicken.
- Patient is ≥ 10 years of age.

All cases whose illnesses were reported within 21 days of the onset of illness were eligible, with the following exceptions:

Exclusion criteria:

- Patient had puppies with diarrhea in his/her dwelling during seven days prior to onset.
- Patient is a professional food handler.
- Patient has been diagnosed with an immune system disease and/or is taking medication or undergoing treatment interfering with immune functions, e.g. chemotherapy.
- No commercial meals in seven days prior to onset.
- English as a second language.
- Completion of interview within 30 days after the date of specimen.

Specific Aim #2. To determine the prevalence of *Campylobacter* in federally inspected wholesale poultry and in food preparation and storage environments at these commercial eating establishments.

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Identification of food establishments

Food establishments were identified through case interviews. The study design established the following criteria:

- If the case reported eating at three or fewer establishments in the week prior to illness, all three of them were sampled.
- If the case reported eating at more than three establishments, the first two (the earliest in the seven-day period) were included in the study, and the third establishment will be chosen based on the number of times it was identified in the food exposure histories of other cases. The selected establishment was the one most frequently identified by previous cases. In the event that there was a tie in the number of times a restaurant was identified by previous cases, the third restaurant was selected randomly. Random selection was done if none of the remaining establishments were named by a prior case-patient.

The DOH Sanitation Branch (SB) collected six swab samples from environmental areas likely to be contaminated. These included swabs from cutting boards, cooking utensils, knives, work-counter surface(s), and four chicken rinses. Samples were processed according to the United States Department of Agriculture established protocols with a few modifications; cultures were plated onto Campy-Cefex agar and isolates were confirmed biochemically and by polymerase chain reaction (PCR).[12,13]

Pulsed field gel electrophoresis (PFGE) was used to molecular subtype the *C. jejuni* isolates from the cases and the poultry derived isolates. Isolates were pulsed as recommended by the Centers for Disease Control (CDC), SmaI-digested DNA was separated using the CHEF-DRIII apparatus (BioRad) and an established pulse time schedule (14). Gel photographs were digitized and PFGE profiles were analyzed using Molecular Analyst Fingerprinting DST version 1.6 software (BioRad).

Specific Aim #3. To identify intervention strategies that can minimize the threat of *Campylobacter* in commercial eating establishments.

Results and Discussion

A total of 153 cases were enrolled and interviewed in this study. The gender distribution was approximately equal with 78 (51%) males and 75 (49%) females. The largest age group enrolled was 20-29 years (28.1%), followed by >65 year old age group, 10-19 year old , and 30-39 year old age group (15.0% respectively).

The predominant symptoms included diarrhea (100%), abdominal cramps (82%), fever (72%), vomiting (32%) and bloody stools (28%). Eighty four percent reported greater than six or more stools in a 24-hour period. The mean duration of illness was 6.3 days.

Of the 153 cases, 76% were treated with antibiotics, the mean duration of illness did not vary between antibiotic versus no antibiotic treatment. In the cases that were treated with antibiotics, the mean duration of illness did not vary between single and multiple antibiotics.

Twenty two (14%) of the cases were admitted to the hospital with an average hospital stay of three days.

The majority of case-patients ate chicken (n=113) that was cooked outside of their house in a commercial establishment during seven days before their diarrhea onset. Of the 113 case-patients that ate chicken outside of the home at a commercial establishment, 71 (63%) case-patients ate chicken outside of the home only, 35 (31%) case-patients reported eating chicken that was cooked inside their house, and 7 (6%) were not sure if they had cooked and/or ate chicken in the home (Figure 1).

The Sanitation and the Food and Drug Branches conducted a total of 69 inspections for this study. Of the 69 inspections, 54 (78%) were restaurants, 14 (20%) supermarkets, 2 (2%) lunch wagons, and 1 (1%) cafeteria. No violations were observed in 42 of 69 (60.7%) inspections. Violations were noted in 27 commercial establishments. The most common violations noted were temperature control and cross contamination violations. Violations of the following hygiene rules were found:

- Adequate refrigerated storage equipment present, properly designed, maintained, and operated so that all potentially hazardous foods (PHF)

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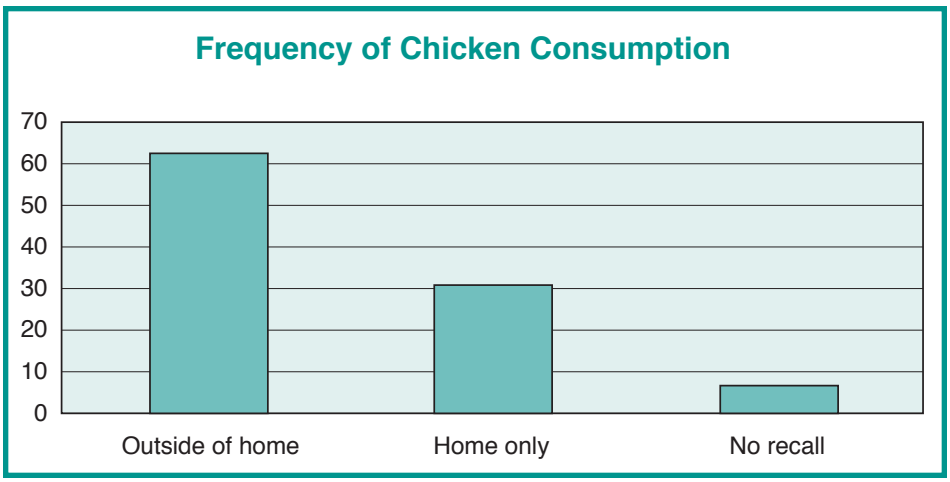

Figure 1: Percent of cases reporting consumption of chicken seven days prior to onset, 2002

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are cooled properly and can be stored at 45˚F or below as required.

- Raw foods or cooked PHF are stored at 45˚F or below except during necessary periods of preparation to prevent bacteria growth.
- Food workers do not handle raw and cooked or prepared food products without thorough hand washing in between to prevent cross contamination.
- Toxic or poisonous chemicals are properly labeled, stored and used so that contamination of food will not occur.

The laboratory examined 690 samples. Two hundred seventy six were chicken samples and 414 were environmental samples. Of the 276 chicken samples, *Campylobacter jejuni* was found on 27 (9.8%) samples and 7 (1.7%) environmental swabs. Clinical isolates of the positive food samples were analyzed by pulsed field gel electrophoresis (PFGE). None of the clinical isolate pulsovar patterns matched the chicken or environmental swabs pulsovar patterns. The pulsovar patterns seen in this study were also unique when compared to the pulsovar patterns in the *Campylobacter* PFGE database.

Due to the limited pulsing of the clinical isolates, this study could not conclusively determine if chicken served in a commercial establishment were the sources of the cases' infections. The clinical isolates were archived and are available for PFGE analysis if funding becomes available to continue this work.

Conclusion

The cause of sporadic campylobacteriosis remains elusive. Further research is warranted to better estimate the epidemiologic and environmental factors leading to illness with *C. jejuni*.

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New CDC Tuberculosis Epidemiologic Studies Consortium

Background

The Tuberculosis Epidemiologic Studies Consortium (TBESC) was created by the Division of Tuberculosis Elimination (DTBE) of the United States (U.S.) Centers for Disease Control and Prevention (CDC) in order to strengthen, focus, and coordinate tuberculosis research. The Hawai`i Department of Health (DOH) is one of 22 sites in the U.S. and Canada that successfully competed for membership in the TBESC in 2001. Members of the TBESC are charged with designing, conducting, and evaluating programmatically relevant epidemiologic, behavioral, economic, laboratory, and operations research concerning the identification, diagnosis, prevention, and control of active Tuberculosis (TB) disease and latent TB infection in North America.

Current Research Projects

Many of the topics identified in the recent Institute of Medicine's Report, *Ending Neglect: The Elimination of Tuberculosis in the United States*[1], are addressed by TBESC research projects to help accelerate the elimination of TB in the US and Canada. The TBESC provides a unique opportunity for Hawai`i to participate in a national consortium of academic, state and metropolitan sites contributing to progressive research that addresses current questions to improve the diagnosis and treatment of latent and active TB in North America.

The TB Control Branch of the DOH is currently involved in two TBESC research projects. The first, *Enhanced Surveillance to Identify Missed Opportunities for Prevention of Tuberculosis in the Foreign-Born,* is the first large population-based epidemiological study of TB among the foreign-born in the U.S. and Canada. This cross-sectional study will focus on in-person interviews with a random sample of 1,500 cases – 50 of whom currently live in Hawai`i - who were diagnosed with TB in 2003-2004.

Figure 1. Tuberculosis Epidemiologic Studies Consortium Sites:

The second project, a *Study of Factors Associated With Acceptance of, Adherence to, and Toxicity From Treatment for Latent Tuberculosis Infection,* is a retrospective chart review intended to better understand the scope of treatment of latent tuberculosis infection (LTBI) in the U.S. and Canada, and to elucidate factors associated with acceptance and completion of such treatment. It will provide a description of the population being offered and given treatment for LTBI in the U.S. and Canada. A prospective cohort study of selected patients who have been offered treatment for LTBI will be conducted upon completion of the chart review.

Significance

Given the high incidence of tuberculosis among Hawai`i's foreign-born population, local TB control activities need to be tailored to the special circumstances of the foreign-born. These circumstances often involve complicating factors such as visa status, drug resistance, social and economic hardships, linguistic barriers, and cultural beliefs that delay diagnosis and may interfere with adherence to therapy and cooperation with contact investigations. Our participation in TBESC research activities will enable Hawai`i to contribute to research leading to the development of interventions that can improve basic TB control activities and provide the scientific foundation for public health efforts to eliminate TB.

For further information, please contact Dr. Jessie Wing, Principal Investigator, or Sara Jacobson at (808) 832-5731 in Honolulu. You may also send email queries or messages to tbesc@tb.health.state.hi.us.

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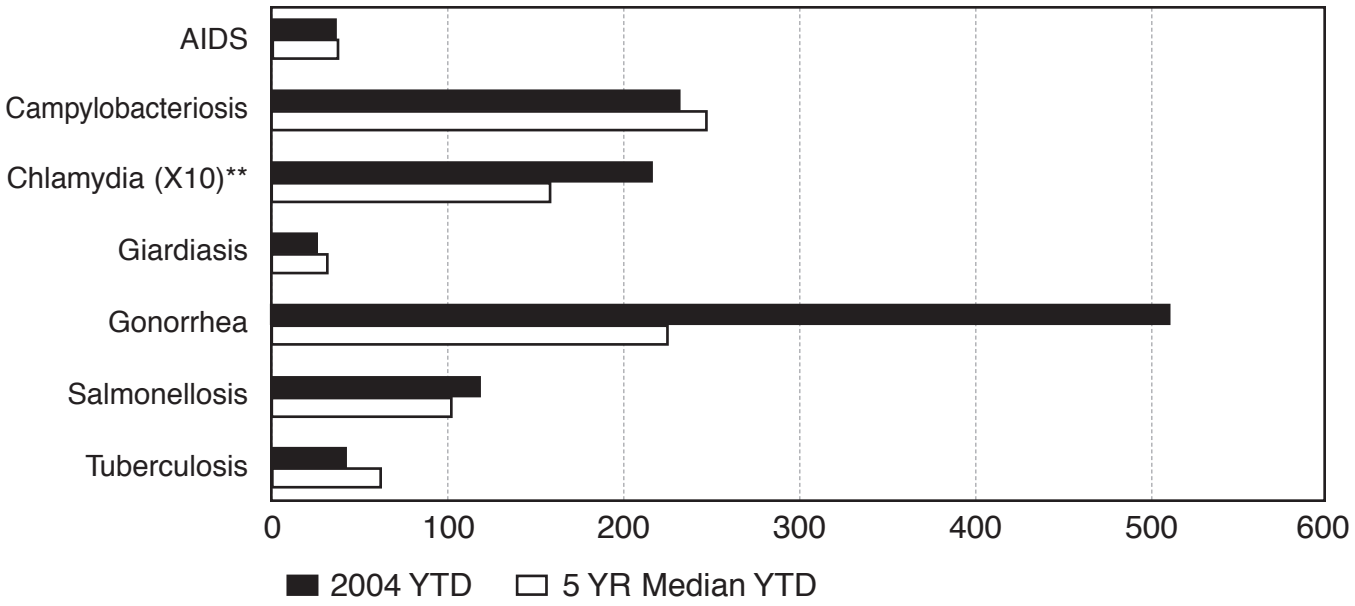
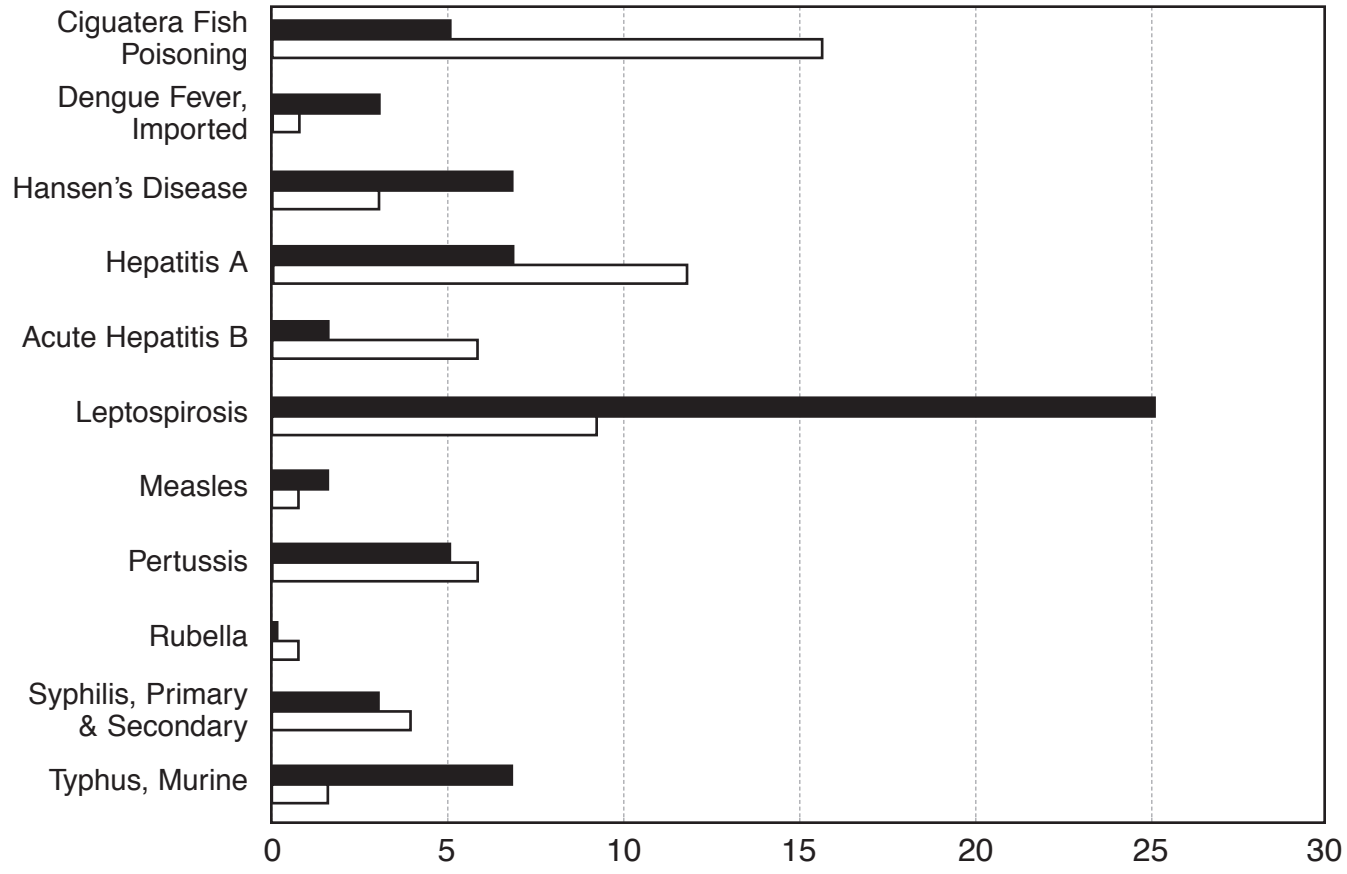
Communicable Disease Surveillance

Selected Diseases by Date of Report*
Hawai'i, 2004 Year-to-date Through May





* These data do not agree with tables using date of onset or date of diagnosis.
** The number of cases graphed represent 10% of the total number reported.